UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FOLEY HOAG, LLP
PATENT GROUP, WORLD TRADE CENTER WEST
155 SEAPORT BLVD
BOSTON, MA 02110

EXAMINER
HERNANDEZ, JOSIAH J

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	09/858,334	LIU ET AL.
	Examiner	Art Unit	
	JOSIAH HERNANDEZ	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>15 May 2001</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-34</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-34</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>15 May 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>05/15/2001</u>.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public
> use or on sale in this country, more than one year prior to the date of application for patent in the United
> States.

2.   Claims 1, 2, 5-7, 11-13, 15, 19, 20, 23, 27-29, and 31 are rejected under 35

U.S.C. 102(b) as being anticipated over Lyberg (US 5,806,033).

        As to claims 1 and 19, Lyberg discloses an information processing

system, a method for recognizing speech to be recognized (column 1 lines 65-

67), the method comprising the steps of maintaining a model of speech accent

that is established based on training speech data (column 2 lines 1-19), wherein

the training speech data includes at least a first set of training speech data (sets

of speech is used in order to modify the model for recognition of the accent,

column 3 lines 5-12), and wherein establishing the model of speech accent

includes not using any phone or phone-class transcription of the first set of

training speech (fundamental tones, such as pitch information, is used for

modeling, column 2 lines 54-56); deriving features from the speech to be

recognized, the features hereinafter referred to as features for identifying accent

(specific information that allow for identification of accents are used, which

include: segment duration of tone and stress levels, column 2 line 58-64);

identifying accent of the speech to be recognized based on the features for

identifying accent and on the model of speech accent (the identification of

accents is not based on phonemes but in specific parameters that indicate

accent in speech, column 2 lines 55-67); and recognizing the speech to be

recognized based at least in part on the identified accent of the speech (once the

accent is identified the system is ready for speech recognition, column 3 lines 10-

17).

As to claims 2 and 20, Lyberg discloses the method of claim 1, wherein

the establishing the model of speech accent includes estimating model

parameters using known accent of the first set of training speech data (the model

parameters include known fundamental tones for identifying a particular accent,

column 3 lines 55-67).

As to claims 5 and 23, Lyberg discloses the method of claim 1, wherein

the model of speech accent includes a hidden Markov model trained to model an

accent without states that specifically model predetermined phones or classes of

phones (column 3 lines 40-50).

As to claim 6, Lyberg discloses the method of claim 1, wherein the step of recognizing the speech to be recognized based at least in part on the identified accent of the speech comprises: deriving features, hereinafter referred to as features for recognizing speech, from the speech to be recognized; and evaluating the features for recognizing speech using at least a speech recognition model that is deemed appropriate for the identified accent (in the process of speech recognition, the system identifies the accent by parameters used for the specific accent, the accent is then identified and the system further modifies itself for speech recognition, column 2 lines 54-67 and column 3 lines 1-15).

As to claim 7, Lyberg discloses the method of claim 6, wherein the features for recognizing speech are not identical with the features for identifying accent (the parameters used for accent identification are specific for accents, such as temporal parameters, the system uses separate speech models to identify speech once adjusted when the accent has been identified, column 2 lines 54-67 and column 3 lines 1-15).

As to claims 11 and 27, Lyberg discloses the method of claim 6, wherein the speech recognition model that is deemed appropriate for the identified accent includes an acoustic model that has been adapted for the identified accent (the

model used for identifying speech, of which is acoustic based, is modified/corrected for the identified accent, column 3 lines 1-16).

As t claims 12 and 28, Lyberg discloses the method of claim 11, wherein the acoustic model that has been adapted for the identified accent was adapted without using accented training speech data (the acoustic model is corrected based on the identified accent and not on the information used to identify the accent, column 2 lines 54-67 and column 3 lines 1-15).

As to claims 13 and 29, Lyberg discloses the method of claim 11, wherein the acoustic model that has been adapted for the identified accent was adapted using training speech data of a language, other than language of the speech to be recognized, that is associated with the identified accent (accents are identified in order to facilitate speech recognition from individuals that are speaking in a language not native to them, column 2 lines 1-15).

As t claims 15 and 31, Lyberg discloses an information processing system, a method for recognizing speech to be recognized (column 1 lines 65-67), the method comprising the steps of: identifying accent of the speech to be recognized based on information derived from the speech to be recognized (column 2 lines 1-19); and evaluating features derived from the speech to be recognized (sets of speech is used in order to modify the model for recognition of

the accent, column 3 lines 5-12) using at least an acoustic model that has been

adapted for the identified accent using training speech data from a language (the

identification of accents is not based on phonemes but in specific parameters

that indicate accent in speech, column 2 lines 55-67), other than primary

language of the speech to be recognized, that is associated with the identified

accent (once the accent is identified the system is ready for speech recognition,

column 3 lines 10-17).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 3, 4, 17, 21, 22, and 33 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lyberg (US 5,806,033) in view of Chen et al. (US 7,177,795).

        As to claims 3 and 21, Lyberg discloses the method of claim 2, wherein

the known accent of the first set of speech training data includes accents of

different languages (column 2 lines 1-19).

        Lyberg does not disclose specifically wherein the known accent of the first

set of speech training data includes mandarin Chinese. Chen teaches using

speech recognition for a particular language (abstract) such as mandarin and other Chinese languages (column 2 lines 41-48).

It would have been obvious to someone skilled in the art at the time the invention was made to modify the system of Lyberg with the ability to identify Chinese language accent as taught by Chen. The system of Lyberg is designed for identifying the accents of any language, including the Chinese languages, since all the claimed elements were known in the prior art, one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 550 U.S.-, 82 USPQ2d 1385).

As to claims 4, 17, 22, and 33, Lyberg discloses The method of claim 2, wherein the known accent of the first set of speech training data includes accents of different languages (column 2 lines 1-19).

Lyberg does not disclose specifically wherein the known accent of the first set of speech training data includes Cantonese Chinese. Chen teaches using speech recognition for a particular language (abstract) such as mandarin and other Chinese languages (column 2 lines 41-48).

It would have been obvious to someone skilled in the art at the time the invention was made to modify the system of Lyberg with the ability to identify Chinese language accent as taught by Chen. The system of Lyberg is designed

for identifying the accents of any language, including the Chinese languages,

since all the claimed elements were known in the prior art, one skilled in the art

could have combined the elements as claimed by known methods with no

change in their respective functions, and the combination would have yielded

predictable results to one of ordinary skill in the art at the time of the invention

(KSR International Co. v. Teleflex Inc., 550 U.S.-, 82 USPQ2d 1385).

5.   Claims 8-10, 18, 24-26, and 34 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lyberg (US 5,806,033) in view of Kuhn et al. (US 6,343,267).

As to claims 8 and 24, Lyberg does not disclose specifically the method of

claim 7, wherein the features for identifying accent are reduced from a larger

dimension of possible features. Kuhn teaches a speech recognition system that

reduces possibilities from a larger dimension and uses matrix Eigen value

decomposition in order to drop the less-useful possible features (abstract).

It would have been obvious to someone skilled in the art at the time the

invention was made to modify the system of Lyberg with the recognition system

of Kuhn. Doing this would have allowed the system to better adapt to different

speakers and recognized accurately the voice of new speakers or different

accents (column 1 lines 19-23).

As to claims 9 and 25, Lyberg does not discloses specifically the method of claim 8, wherein the features for identifying accent are reduced from a larger dimension of possible features using Eigen value decomposition. Kuhn teaches a speech recognition system that reduces possibilities from a larger dimension and uses matrix Eigen value decomposition in order to drop the less-useful possible features (abstract).

It would have been obvious to someone skilled in the art at the time the invention was made to modify the system of Lyberg with the recognition system of Kuhn. Doing this would have allowed the system to better adapt to different speakers and recognized accurately the voice of new speakers or different accents (column 1 lines 19-23).

As to claims 10 and 26, Lyberg does not disclose specifically the method of claim 8, wherein the features for identifying accent are reduced from a larger dimension of possible features by determining and dropping less-useful possible features during training. Kuhn teaches a speech recognition system that reduces possibilities from a larger dimension and uses matrix Eigen value decomposition in order to drop the less-useful possible features (abstract).

It would have been obvious to someone skilled in the art at the time the invention was made to modify the system of Lyberg with the recognition system of Kuhn. Doing this would have allowed the system to better adapt to different

speakers and recognized accurately the voice of new speakers or different

accents (column 1 lines 19-23).

As to claims 18 and 34, Lyberg does not disclose specifically the method

of claim 15, wherein adapting the acoustic model that has been adapted included

transforming phonetic transcriptions of the training speech data, from the

language that is associated with the identified accent, into phonetic transcriptions

according to the language of the speech to be recognized, and then using the

result as if it were training speech data of accented speech for model adaptation.

Kuhn teaches a system for speech recognition that uses phoneme transcription

in order to identify the speech (column 4 lines 31-44).

It would have been obvious to someone skilled in the art at the time the

invention was made to modify the system of Lyberg with the use of phonetic

transcription. Using phoneme analysis for speech recognition is commonly used

in the art and would have been obvious to combine the reference showing

improved functionality.

6.   Claims 14, 16, 30, and 32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lyberg (US 5,806,033) in view of Chen et al. (US 7,177,795) as

applied to claim 3 and 4 and in further view of Olorenshaw et al. (US 7,139,708).

As to claims 14, 16, 30, and 32, Lyberg discloses identifying accents in order to facilitate speech recognition from individuals that are speaking in a language not native to them, column 2 lines 1-15).

Lyberg does not disclose specifically the method of claim 13, wherein the language of the speech to be recognized is English, and the language that is associated with the identified accent is mandarin Chinese if the identified accent is a mandarin Chinese accent. Chen teaches using speech recognition for a particular language (abstract) such as mandarin and other Chinese languages (column 2 lines 41-48). Olorenshaw teaches a system that identifies accents/pronunciation differences in the English language (column 4 lines 56-67).

It would have been obvious to someone skilled in the art at the time the invention was made to modify the system of Lyberg with the ability to identify Chinese language accent as taught by Chen and identifying different English accents as taught by Olorenshaw. The system of Lyberg is designed for identifying the accents of any language, including the Chinese languages, since all the claimed elements were known in the prior art, one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (KSR International Co. v. Teleflex Inc., 550 U.S.-, 82 USPQ2d 1385).

Conclusion

Any inquiry concerning this communication should be directed to Josiah Hernandez whose telephone number is 571-270-1646. The examiner can normally be reached from 7:30 pm to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JH

/David R Hudspeth/

Supervisory Patent Examiner, Art Unit 2626